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WASHINGTON

Obstetrical and Gynecological Society.

THIRD ANNUAL ADDRESS OF
THE PRESIDENT,

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SAMUEL C. BUSEY, M.D.

THE HYGIENE OF PREGNANCY.

Reprinted from THE AMERICAN JOURNAL OF OBSTETRICS AND DISEASES
OF WOMEN AND CHILDREN, Vol. XIX., January, 1886.



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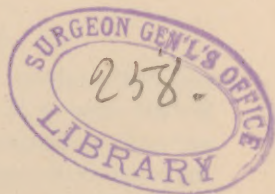
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THIRD ANNUAL ADDRESS OF THE PRESIDENT.

GENTLEMEN:—It gives me great pleasure to congratulate you on the continual prosperity of this Society. It has successfully surmounted the obstacles which such organizations encounter in the beginning, and can now appeal with exultation and pride to its record for proof of the value and wisdom of its foundation. The maintenance of the high character which has been established will, however, demand further concessions of time, more assiduous labor, and increased zeal in original investigation. There is a great variety of subjects in obstetrics, gynecology, and pediatrics, which are yet involved in obscurity, which present a wide field for observation and discovery. To the investigations of such questions I would invite your special attention in the future.

THE HYGIENE OF PREGNANCY.

In a recent contribution,¹ I expressed the opinion that the natural laws governing the child-bearing life of woman should constitute safer guides for the sanitation of pregnancy than the artificial methods which necessity and experience have invoked. I did not, however, mean to undervalue the expedients and procedures which medical skill and science offer to prevent,

¹ Gynecological Transactions, Vol. X.

mitigate, and cure the diseases of pregnancy. Whilst I maintain that these laws should constitute the fundamental basis of any code of hygiene that will attain the highest aim in the prevention of the diseases of pregnancy; reduce the mortality of child-bearing to its minimum; and promote the longevity of post cessation life, I am compelled to admit the impossibility of their general enforcement. The duty, then, devolves upon the profession to devise other methods of conservation of the lives of pregnant women which, if not the best, will secure the best results human skill can reach.

For convenience, I limit the hygiene of pregnancy to the preservation of the health of woman during those periods of her life beginning with conception and terminating with the commencement of labor. This is an arbitrary limitation, for it cannot be technically asserted that pregnancy is concluded until the womb is completely evacuated of fetus and secundines. It excludes also the diseases of intrauterine life. The preservation of the health of the mother so constantly and directly refers to the health and life of the fetus that it must necessarily follow that the hygiene of pregnancy will comprehend, to a certain extent, the hygiene of the fetus; but only so far does it relate to the diseases of intrauterine life.

The changes, consequent upon pregnancy, which take place in the general organism, glandular system, and generative organs are physiological. Pregnancy is not a disease, yet the laws of diagnosis have, as yet, failed to define the limit where the physiological ceases and the pathological begins. The structural changes and formative activity establish conditions susceptible of easy, and sometimes rapid and insidious transformation into morbid processes. They invite and present the opportunity for the detrimental influence of trivial and extraneous agencies. It is not, therefore, surprising that the acquired causes of the diseases of pregnancy should be numerous and multifarious.

The virgin uterus measures but sixteen square inches in superficial area, the pregnant womb, at term, three hundred and forty. The textural changes which take place, involve every constituent tissue of the organ. The constantly increasing superficial area, weight, and dimensions of the pregnant womb take place in a cavity supposed in a normal condition to be always full. This

cavity is inclosed, for the greater part, with walls possessing great expansile and elastic properties; nevertheless, especially in primiparæ, the mechanical disturbances of its contents are manifold and, oftentimes, serious. The cavity is filled to repletion and its walls stretched to their utmost tension. The neighboring viscera are displaced and compressed. The movements of respiration are interrupted. The thorax is diminished in depth and increased in breadth. Vital capacity is lessened. The portal circulation is disturbed. The arterial and venous blood currents in the vessels in the abdominal cavity and lower extremities are obstructed; as a consequence there is "superior arterial hyperemia and inferior venous hyperemia (Barnes)." Thus local congestions may be determined. The complex processes of digestion, nutrition, and elimination, in some one or more respects, may be impeded, impaired or perverted. The peristaltic movements of the intestinal tract are so constantly lessened with the increasing volume of the uterus that constipation, more especially during the later months of pregnancy, is a common and troublesome complication. In consequence of the diminished capacity of the bladder, micturition is more frequent and annoying. These disturbances of the functions of the organs and anatomical relations of the parts, caused by the presence and continuous growth of a vascular and highly organized tumor in a closed cavity, lined by an acutely sensitive membrane, stretched in various parts to its utmost tension, would seem to present a variety of conditions favorable to the development of disease. This danger is vastly augmented by the constantly increasing afflux of blood to, and the exaltation of nutritive and formative activities in, the uterus and genitalia.

The changes which take place in the constitution of the blood approach, even more closely, pathological conditions. The red corpuscles, albumin, iron, and salts are diminished. The white corpuscles, fibrin, and water are increased. With the increase in volume there is increasing impoverishment of the blood and loss of the carriers of oxygen. Consumption and waste, and elimination of carbonic acid and urea are augmented with diminished ingestion and assimilation of food. Cell nutrition and metamorphosis are consequently deranged. With the increase of water and fibrin, and loss of albumin, a condition of

serous plethora and hyperinosis is established, which favors transudation, coagulation, and thrombosis.

Not less important are the dynamic changes in the circulation. With hypertrophy of the heart, there is dilatation of its cavities and increased arterial tension. It may be that these dynamic changes are compensatory and not resultant. For they coexist with lessened vital capacity, diminished oxygenation, increased blood mass, blood degradation, and hyperinosis with increased liability to coagulation.

These blood and circulatory changes begin and progress consentaneously with the nutritive and developmental processes taking place in the generative organs. With the rapid growth and increasing demand of the new being for sustenance, there is progressive waste with lessened food supply. With the augmentation of blood mass there is anemia, diminished oxygenation, and increased propulsive power of the circulatory apparatus.

The changes which take place in the glandular system are equally interesting and no less remarkable. Probably all the glands undergo some change, due, perhaps, to the increased work imposed upon them. The thyroid gland and spleen are usually enlarged, the latter sometimes very much so. The thyroid enlargement may have some connection with the hypertrophy of the heart and increased arterial tension. The condition of the spleen would seem to be directly connected with the blood changes. They may be conservative processes, but are closely allied to certain pathological conditions.

The most notable gland changes are those which occur in the secretory and excretory glands. The salivary glands, the glands of the uterine neck, the sebaceous and sudoriparous glands, and those of the stomach, all, to a greater or less extent, varying with individual peculiarities and susceptibilities, undergo functional and organic change. These modifications of gland structure and function may be the physiological outgrowths of the circulatory disturbances, increased nerve irritability, and extraordinary activity of the nutritive energies. Turgescence is a common factor, and increased secretion a common result. They are probably eliminative and compensatory conditions, but why should they vary so much in different women, and in the succeeding pregnancies of the same

woman without apparent cause? As a rule, the increased secretions are simply the physiological result of glandular activity. Excessive salivation, uterine hydrorrhea, and the vomiting of unusual quantities of fluid must, however, be considered pathological.

The changes which take place in the mammary glands are developmental. Milk is the natural aliment of young animals. Maternal lactation is the natural method of supplying it to the infant. The secretion of milk is the ultimate product of those changes in these glands, which begin with pregnancy and are completed during the earlier days of the puerperium. Lactation begins with birth of the offspring, and continues for an indefinite period. The function is not suddenly established, nor does it suddenly subside. The periodical evolution of the breasts corresponds with the progress of pregnancy. Both processes are gradual. The gradual subsidence and cessation of the function of milk secretion should correspond with the gradual involution of the gland structure and its return to a state of quiescence and diminished size. With the recurrence of pregnancy the process of evolution and functional activity is re-awakened. No other organs of the body, except the uterus and ovaries, are subjected to similar periodical changes. As the uterus and ovaries, so likewise the mammary glands, when the period of sexual involution begins, undergo those changes which finally terminate glandular activity. The processes of periodical evolution and involution are in inverted parallelism. The former is as necessary to promote the secretion of milk as the latter is to restore the gland to a normal quiescent condition, to await rehabilitation and renewed functional activity with succeeding pregnancy. To the functional irregularities and derangements caused by artificial interference with these physiological processes must be traced many of the tumor diseases to which these glands are so liable.

Several years ago, when engaged in the study of the diseases of the lymphatic system, I suggested that the cicatrices and pigmentations of pregnancy were due to disturbances of the lymph spaces. Subsequently, I demonstrated that the cicatrices were dilated lymph spaces of the corium. Since then Creighton has verified my suggestion in regard to pigmentation. These pigmentations are due to the deposition in the lymph

spaces and other lymph structures of the waste products of evolution. The discoloration of the areolæ of mammary glands is one of the earliest signs of the evolution, and the latest to disappear in the involution of the glands. It is the result of the deposit of pigment granules in the connective-tissue spaces. Granular pigmented cells are also found within the secretory acini and in the lymph spaces of the subjacent lymphatic glands. The pigmentations in other localities are, probably, similar depositions of the waste products of tissue changes taking place in adjacent and neighboring parts.

The lymphatic structures of the mammæ are essential appendages of the secretory apparatus of the glands; and in the breasts, as elsewhere throughout the body, are the receptacle of the redundant elements and products of nutrition. The absorption and disposal of these products and their elaboration and utilization are the special functions of the lymphatic system. These processes are very active during pregnancy.

Physiological leucocytosis is one of the characteristic phenomena of pregnancy. Virchow¹ was the first to call attention to the fact that these periodical excesses of white corpuscles in the blood were not due to changes taking place in the blood itself. They are mainly the product of irritation of the lymphatic glands. He says: "In proportion as pregnancy advances, as the lymphatic vessels of the uterus dilate, and the interchange of material in the organ increases with development of the fetus, the lymphatic glands in the inguinal and lumbar regions become considerably enlarged, and sometimes to such an extent that, if we were to find them in a similar state at any other time, we should regard them as inflamed. This enlargement conveys into the blood an increased quantity of fresh particles of a cellular nature, and thus from month to month the number of colorless corpuscles augments." The lymphatic structures of the pelvic region must be the chief source of the leucocytosis of pregnancy; but with Creighton² we "must believe that the abundant cellular waste products of the breasts contribute to that condition."

The disposal and utilization of the unused and waste products of secretion is one of the marvellous phenomena of pregnancy.

¹ "Cellular Pathology," p. 224.

² "Physiology and Pathology of the Breast."

The lymphatic system is the laboratory in which these materials are re-prepared for future nutrition. The increased burden imposed upon it excites new and augmented activities. It seems to occupy the relation of an intermediary, completing the physiological processes and protecting the organism from pathological conditions. But as organs of reception, filtration, elaboration, and conveyance, the lymph glands and structures may become foci for the generation and diffusion of disease.

The liver and kidney have increased work to do during pregnancy. Trousseau and several other observers have insisted that the liver was enlarged. It supplies the bile which is an essential element of digestion. It is also an excremental organ, inasmuch as it receives the blood from the portal system which is charged, in part at least, with the products of augmented blood-supply to the pelvic organs and of the enormous developmental work which takes place in that region. The portal blood must be loaded with these excrementitious matters, and greatly increased duty must, consequently, be imposed upon the liver. As an emunctory, the liver is usually equal to the emergency; but this function must be supplemented by the increased eliminative capacities of the skin, lungs, and kidneys. In health these organs preserve their compensatory activities; but ineffective power in either may lead to accumulations in the blood which will poison the entire organism and produce disastrous results. The lungs eliminate carbonic acid; the skin dissipates animal heat, and excretes water, urea, and salts; but the kidneys are the chief emunctory glands. Upon them devolves mainly the elimination of the useless and poisonous products of secretion and tissue change. They have no recremental function to execute. Through them the waste is finally discharged. This office is a relentless necessity. The compensatory organs are absolutely inadequate to assume the duty and maintain health. During pregnancy the work is vastly increased, and a larger quantity of abnormal elements find their way into the urine. With the progress of uterogestation the more urgent is renal elimination, and the more imminent the danger of disturbance of the function.

I need not now detain the reader with a recital of the pathological phenomena of the albuminuria of pregnancy; but I cannot permit the occasion to pass without impressing upon

him the importance of early recognition of the initial sign of its presence. I have more than once expressed the opinion that puerperal eclampsia and its lamentable consequences were too often attributable to neglect. I hold that the pregnant woman should be under the continuous observation of a competent physician; and when such is the case, he is responsible for the occurrence of avoidable disease. I believe, furthermore, that if such observation were diligently and intelligently pursued, the cases of eclampsia would be greatly diminished, and the mortality would be reduced to its minimum.

I venture to call attention to another circumstance too often forgotten. More women die of renal disease during the period of child bearing life than men of the same age. The ordinary result of complete recovery from puerperal nephritis after delivery is too often accepted as inevitable, and the patient is discharged without even an admonition of the peril which may hasten her untimely death.

I will remind you also of the physiological relationship and reciprocal dependence of the excretory functions of the lungs, skin, intestinal tract, and kidneys. Disturbance of this close connection may speedily develop great disorder.

Until recently, the appearance of albumin in the urine was universally held to be the symptom of threatening danger, notwithstanding the facts that in very many cases no grave complications occurred; and in many other cases, even when the symptoms denoted serious lesions of the kidneys, all traces of disease speedily and spontaneously subsided after the evacuation of the uterus. There can no longer be any doubt that albumin does appear in the urine during health as a physiological phenomenon; but whether such a condition is ever present during pregnancy is yet a mooted question.

Physiological albuminuria has been ascribed to various causes. The presence of albumin in the urine of the new born has been attributed, by Ribbert, to the protoplasmic condition of the cells of the glomeruli; by Rosenback, to superfluous albumin in the blood, due to too rapid disintegration of blood-corpuscles; and by Senator, to the increased vascular pressure in the glomeruli, coincident with increased loss of water through the skin and lungs and disintegration of blood-corpuscles. In the urine of the healthy adolescent, it is ascribed to rapid

growth and development ; and in the urine of healthy adults, to excessive muscular activity, the ingestion and digestion of highly-albuminous foods, mental excitement, and cold bathing.¹ Does the state of pregnancy present any conditions analogous to these alleged causes of physiological albuminuria occurring in males and non pregnant persons ? If so, why should not a similar result follow ? It may be straining facts too far to insist that the increased arterial tension, the blood degradation, the rapid growth and development, the mental disquietude, the augmented cutaneous and pulmonary exhalations, and anemia of pregnancy are phenomena similar to those present in otherwise healthy infants, adolescents, and adults, in whose urine albumin may be found ; but the conclusion will not appear so over drawn when to those conditions may be added the probable disturbance of the functions of the liver, the almost constant presence of alimentary and nervous perturbations, and possible ingestion of an excessive quantity of highly-albuminous foods, which are occasional factors in the causation of albuminuria. Special mention is made of cold bathing as a cause of physiological albuminuria. May not sudden chilling of the cutaneous surface, rapid dissipation of heat, and consequent determination of chilled blood to the internal organs be an equally effective agency, when the result of imprudent exposures and insufficient clothing ? Cold bathing, though a frequent, is not such a common practice among pregnant women as other indiscreet exposures of the person to chilling influences.

Pregnancy exhibits during its progress many other phenomena not unlike those frequently associated with albuminuria in non pregnant persons, and believed to be active agencies in the causation of such pathological conditions. The most common immediate cause of puerperal albuminuria, and perhaps an equally frequent cause in the non-pregnant, is the increased tension of blood in the glomeruli, either from increased afferent pressure or undue efferent resistance. The arterial tension of pregnancy finds its causes in the enlarged left ventricle, greater blood mass, blood degradation, disturbances of the excretory organs, especially of the skin and bowels, and derangements of the nervous system, either local, general, or reflex. The efferent resistance may be either capillary or venous, and may

¹ Medical News, August 29th, 1885.

be due to functional or mechanical conditions. If, then, these phenomena are physiological in the pregnant female, and pathological in the non-pregnant, and in each instance stand in like etiological relation to albuminuria, must the appearance of albumin in the urine differentiate an abnormal from a normal pregnancy? Experience tells us that in many cases of pregnancy very large quantities of albumin appear in the urine without the occurrence of any serious complication, and that it usually disappears after delivery, and sometimes after the death of the fetus *in utero*. It may be physiological in a few, functional in many more; but we must in the future, as in the past, continue to regard it as pathological in the majority of cases, and as a danger signal of the gravest importance.

With this *ensemble* of physiological conditions and pathological possibilities, do you marvel that some pregnant women get sick and a number die? It is no answer to tell me that the ailments and mortality of pregnancy are incidents of education and civilization. If so, the most effective method of hygiene would be the relegation of every pregnant woman to baserotted ignorance, barbarism, and beastliness—a remedy more revolting even than “*Vou-doo*” medicine, which traces cause and effect, and disease and recovery to stupid, disgusting and criminal superstitions. In view of the facts that among civilized people the average lifetime is greater, the mortality of the lying-in is less, and more women live out the allotted lifetime now than during any previous period of medical history, I repudiate any analogy derived from the customs, habits, practices, and their results among nomadic, aboriginal, and barbaric races and peoples. With the progressive improvements in the conduct and management of the pregnant and puerperal states, the expectancy of life and longevity of the post-cessation life have increased.

The hygiene of pregnancy demands an acuteness and accuracy of diagnosis not always or easily acquired. The physiological so frequently approaches the pathological that differentiation of disease is involved in embarrassing obscurity. The insidious beginning of morbid processes is often so illy-defined, and the consequences of delay are so disastrous that the accoucheur cannot afford to abide the issue of complete development when the diagnosis is plainly written in the picture of a

grave disorder threatening immediate danger. He must be alert, accurate, ready, and self-reliant.

The present occasion does not permit me to engage in a detailed description of the special disorders of pregnancy. I must assume that you are quite as competent as I am to recognize and treat such diseases. But, following the line of argument previously pursued, I must insist that the most effective method of prevention of the morbid complications of pregnancy consists in the preservation of the normal functional activities of the excretory and emunctory organs.

The constant and necessary physiological relation subsisting between the skin, lungs, alimentary tract, and kidneys demands vigilant supervision. Constipation should be relieved. No fecal mass should be allowed to accumulate in the intestines. The bowels should be kept in a solvent condition, and an evacuation should be secured every day, either by regulating the diet and habits of the patient, or by such mild, but sufficiently effective therapeutic agents as a skilled discretion may suggest.

It often happens that patients deceive themselves by inattention, and their medical attendant either by evasive or exaggerated statements concerning the state of their bowels. As a rule, one can verify or not, as the case may be, such statements by an examination of the tongue and conjunctivæ, by mal-odor of the breath and person, and by inquiries in regard to the condition of the stomach, appetite, and digestion, the nature and quantity of food, when and how often taken, and whether the ingestion of food and drinks are accompanied or associated with any sense of fulness, discomfort, flatulence, or acidity. Not only will a careful investigation detect the existence of habitual constipation when a positive assurance to the contrary has been given, but it may disclose the cause, and indicate at once the method of treatment.

The inspection of exposed cutaneous surfaces will be greatly aided by palpation. Cleanliness of the skin, and the free functional activity of the sebaceous and sudoriparous glands must be secured by necessary tepid or hot ablutions or bathing. Cold bathing is not always safe. The drinking of large and unnecessary quantities of liquids—an injurious habit with very many people—imposes augmented labor upon those organs

charged with the exhalation of fluids. Excessive micturition and profuse sweating are occasionally annoying results of the **excessive consumption of liquids**.

The respiration may be embarrassed by the mechanical repletion of the abdominal cavity, and by the altered contour of the thorax, which are unavoidable conditions. This discomfort may be greatly aggravated by flatulent distention and over-loading of the alimentary tract, due to the ingestion of acescent and unsuitable foods, and to constipation before referred to. A more significant disturbance of the respiration may result from the blood degradation and anemia.

The constituent and dynamic changes in the circulation more often perhaps pass the physiological limit than any other of the phenomena of pregnancy. The blood is a fluid tissue. Into it are poured (Osler) the commodities needed for nutrition, and from it the other tissues derive the materials they require. Notwithstanding the ceaseless change and exchange which go on, a uniformity of composition is one of the striking characteristics of health. The blood-plasma is supposed to supply nutriment to the tissues, and the red blood corpuscles are the carriers of oxygen and carbonic acid. In pregnancy, the former is greatly diluted, and the latter greatly diminished in number. When these changes pass the limit of health, the consequences are numerous and may be serious. Cell nutrition is interrupted; formative activity is lessened; the metabolism of tissues is disturbed; waste increases, followed by impaired appetite, enfeebled digestion, loss of physical vigor, increased nerve irritability, altered and diminished excretion and secretion, with occasional cerebral and intellectual disturbances. These conditions may be associated with some one or more of a variety of resultant nervous perturbations, or other not uncommon disorder of pregnancy. The anemia of pregnancy is, to a greater or less degree, always present. As an element of causation in the production of the diseases of pregnancy it cannot be excluded, and must be accepted as the most constant and potential factor. To it, and to the mechanical disturbances of the abdominal viscera, and interference with the function of respiration, we must look for the causes of most of the morbid complications of pregnancy. When this anemia has reached a high grade, its ravages are not easily arrested during the con-

tinuance of pregnancy. Our best and most successful efforts never free us from the apprehension of recurring danger. Prevention is the sheet-anchor. To effectively accomplish this, a vigilant supervision of the patient is imperative. The diet must be regulated and adapted to existing circumstances; disturbances of the alimentary tract must be obviated; the excretory and eliminative functions must be protected; sufficient sleep must be secured; all sources and causes of anxiety, irritation, and excitement must be removed; sunlight and fresh air must be supplied; and last, though not the least important, exercise in the open air must be insisted upon. To these hygienic measures, such therapeutic treatment should be added as intelligent experience and observation have proven to be useful.

The hygiene of person should be supplemented with the hygiene of habitation and sleeping-apartments. A large, dry, well-ventilated and well-lighted room, above the ground floor, should be selected for the sleeping-apartment, and this should be in a dwelling equally faultless in regard to ventilation, dryness, sunlight, and freedom from noxious effluvia, and sewer or deleterious exhalations. As pregnancy advances, the clothing should be adapted to the changes in contour and form; all tightly-fitting garments, stays, garters, and other uncomfortable appendages should be either entirely dispensed with or so adjusted as to remove unequal pressure, and avoid the constriction of parts.

In conclusion, a few words personal to myself. This meeting terminates the third year of the existence of this Society, and closes the third term of my presidency. I have endeavored to discharge the duties of this office with impartiality. If mistakes have been committed, do me the favor to ascribe them to errors of judgment. I could not expect to enjoy this honor any longer, nor would it be just to other members equally, if not more, deserving and competent. Accept my thanks for the honors you have conferred upon, and the confidence you have reposed in me, and believe that it will give me great pleasure to welcome your choice as my successor to these duties, and this high honor. I wish each one and all of you health, and long and prosperous lives.

